

WHAT IS CLAIMED IS:

1. A method of manufacturing a semiconductor device comprising the steps of:
forming a semiconductor film on an insulating surface;
crystallizing the semiconductor film by irradiation of harmonic of a YVO₄ laser;
patterning the crystallized semiconductor film to form a crystallized island-like semiconductor film; and
forming at least a channel region of a thin film transistor in the crystallized island-like semiconductor film.
2. A method of manufacturing a semiconductor device according to claim 1, wherein the semiconductor film is an amorphous semiconductor film or a micro crystal semiconductor film.
3. A method of manufacturing a semiconductor device according to claim 1, wherein the harmonic is one of second harmonic, third harmonic, and fourth harmonic.
4. A method of manufacturing a semiconductor device comprising the steps of:
forming a semiconductor film on an insulating surface;
crystallizing the semiconductor film by irradiation of a continuous wave YVO₄ laser;
patterning the crystallized semiconductor film to form a crystallized island-like semiconductor film; and
forming at least a channel region of a thin film transistor in the crystallized island-like semiconductor film.
5. A method of manufacturing a semiconductor device according to claim 4, wherein the semiconductor film is an amorphous semiconductor film or a micro crystal semiconductor film.
6. A method of manufacturing a semiconductor device according to claim 4, wherein one of second harmonic, third harmonic, and fourth harmonic of the continuous wave YVO₄ laser is irradiated to crystallize the semiconductor film.

7. A method of manufacturing a semiconductor device comprising the steps of:
forming a semiconductor film on an insulating surface;
crystallizing the semiconductor film by irradiation of linear laser light of a YVO₄ laser;
patterning the crystallized semiconductor film to form a crystallized island-like semiconductor film; and
forming at least a channel region of a thin film transistor in the crystallized island-like semiconductor film.
8. A method of manufacturing a semiconductor device according to claim 7, wherein the semiconductor film is an amorphous semiconductor film or a micro crystal semiconductor film.
9. A method of manufacturing a semiconductor device according to claim 7, wherein the linear laser light is one of second harmonic, third harmonic, and fourth harmonic of the YVO₄ laser.
10. A method of manufacturing a semiconductor device comprising the steps of:
forming a semiconductor film on an insulating surface;
crystallizing the semiconductor film by irradiation of harmonic of a continuous wave YVO₄ laser;
patterning the crystallized semiconductor film to form a crystallized island-like semiconductor film; and
forming at least a channel region of a thin film transistor in the crystallized island-like semiconductor film.
11. A method of manufacturing a semiconductor device according to claim 10, wherein the semiconductor film is an amorphous semiconductor film or a micro crystal semiconductor film.
12. A method of manufacturing a semiconductor device according to claim 10, wherein the harmonic is one of second harmonic, third harmonic, and fourth harmonic.
13. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film on an insulating surface;
patterning the semiconductor film to form an island-like semiconductor film;
crystallizing the island-like semiconductor film by irradiation of harmonic of a YVO₄ laser;
and

forming at least a channel region of a thin film transistor in the crystallized island-like semiconductor film.

14. A method of manufacturing a semiconductor device according to claim 13, wherein the semiconductor film is an amorphous semiconductor film or a micro crystal semiconductor film.

15. A method of manufacturing a semiconductor device according to claim 13, wherein the harmonic is one of second harmonic, third harmonic, and fourth harmonic.

16. A method of manufacturing a semiconductor device comprising the steps of:
forming a semiconductor film on an insulating surface;
patterning the semiconductor film to form an island-like semiconductor film;
crystallizing the island-like semiconductor film by irradiation of a continuous wave YVO₄ laser; and
forming at least a channel region of a thin film transistor in the crystallized island-like semiconductor film.

17. A method of manufacturing a semiconductor device according to claim 16, wherein the semiconductor film is an amorphous semiconductor film or a micro crystal semiconductor film.

18. A method of manufacturing a semiconductor device according to claim 16, wherein one of second harmonic, third harmonic, and fourth harmonic the continuous wave YVO₄ laser is irradiated to crystallize the island-like semiconductor film.

19. A method of manufacturing a semiconductor device comprising the steps of:
forming a semiconductor film on an insulating surface;
patterning the semiconductor film to form an island-like semiconductor film;

crystallizing the island-like semiconductor film by irradiation of linear laser light of a YVO₄ laser; and

forming at least a channel region of a thin film transistor in the crystallized island-like semiconductor film.

20. A method of manufacturing a semiconductor device according to claim 19, wherein the semiconductor film is an amorphous semiconductor film or a micro crystal semiconductor film.

21. A method of manufacturing a semiconductor device according to claim 19, wherein the linear laser light is one of second harmonic, third harmonic, and fourth harmonic of the YVO₄ laser.

22. A method of manufacturing a semiconductor device comprising the steps of:
forming a semiconductor film on an insulating surface;
patterning the semiconductor film to form an island-like semiconductor film;
crystallizing the island-like semiconductor film by irradiation of harmonic of a continuous wave YVO₄ laser; and

forming at least a channel region of a thin film transistor in the crystallized island-like semiconductor film.

23. A method of manufacturing a semiconductor device according to claim 22, wherein the semiconductor film is an amorphous semiconductor film or a micro crystal semiconductor film.

24. A method of manufacturing a semiconductor device according to claim 22, wherein the harmonic is one of second harmonic, third harmonic, and fourth harmonic.